

# Meeting the challenge for foot health in rheumatic diseases

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## Abstract

**Background:** National guidelines recommend that patients with rheumatic diseases should have access to podiatry services and evidence is emerging that podiatry interventions are effective in the management of foot problems in this patient group. Despite this recognition it is generally perceived that access to podiatry services appears to be varied or absent. **Objectives:** To identify the nature of foot health problems presenting in a rheumatology clinic and to ascertain the availability and suitability of foot care for these problems. **Method:** A convenience sample of 139 patients (100 female and 39 male) was recruited. An assessment of foot health, and footwear was carried out and patients completed the foot function index (FFI). Any unmet foot care needs were identified. **Results:** The majority of the 139 patients presented with symptomatic callus and toenail problems and over half with foot deformity. There was no clear difference between genders. There was evidence of the effects of foot pain caused by these problems but low prescription of foot orthoses and specialist footwear. **Conclusion:** Overall this study indicates that poor foot health and foot pain as being common in patients with rheumatic diseases. The lack of foot care could lead to reduction in mobility and in some cases serious complications. This paper recommends that a specialist and dedicated foot care service is provided for these patients.

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## 1. Background

We are now in the Bone and Joint Decade [1] and the challenge has been firmly placed for all health care professionals to improve the services for patients with rheumatic diseases so that they can receive care in an appropriate and timely way. The ultimate aim of this challenge is to reduce the impact of rheumatic disease by reducing pain, improving mobility and thereby limiting the effects of disability.

The evidence base for dedicated podiatry as part of multidisciplinary foot clinics in diabetes is well established [2] but this has yet to be achieved for rheumatology services. However, the role of the podiatrist in the rheumatology team is becoming recognised as a vital component in the integrated care given to patients by the multidisciplinary team [3,4]. Increasingly consultants and their teams are requesting specialist foot care services and it is suggested that the podiatrist is a key practitioner in the management of patients with musculoskeletal disease [4–6]. It has been rec-

ommended [7–9] that patients should understand the role and have access to a podiatrist. Despite this recognition it is generally perceived that access to podiatry services for patients with rheumatic diseases appears to be varied and in some instances absent.

Foot involvement has been reported in between 50 and 89% of patients with rheumatoid arthritis (RA) [10,11] with the basic pathological changes involving a combination of synovitis and mechanical stress [12]. Common manifestations include hallux valgus, valgus heel deformity and lesser toe deformities, which cause severe foot pain and reduced mobility. This foot deformity also predisposes to callus formation and in a number of patients, foot ulceration, particularly in cases with poor tissue viability. Bacterial, fungal skin and nail infections are more prevalent in this patient group adding to the serious risk of ulceration (Fig. 1) and systemic infection. This risk of infection is further increased if the patient's medical management is by immunosuppressive drugs [13,14].

It is reported [15] that the goals of foot care for patients with RA are to relieve pain, maintain function and improve the quality of life using safe and cost-effective treatments, such as palliative foot care, prescribed foot orthoses and

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Fig. 1. Ulcerated feet associated with RA foot deformity.

specialist footwear. Small trials and case reports have promoted the value of prescribed orthoses and footwear in the management of the rheumatoid foot [16–18]. It is known that early intervention with foot orthoses reduces foot pain and has a sustained effect in reducing the impact of abnormal foot function and disability [19]. The value of podiatry involvement in the assessment of patients for prescription footwear has been highlighted and has been shown to improve compliance with this intervention [20].

Foot problems are known to occur in other rheumatic diseases. In patients with systemic sclerosis, painful and potentially limb threatening foot problems occur in the majority of cases [21]. It is recognised that the care of the feet is important in preventing major foot problems and amputations in this patient group. The role of the podiatrist in the orthotic management of juvenile chronic arthritis has been highlighted as being essential [22] and a significant reduction of reported pain in osteoarthritic knees has been demonstrated when patients were provided with foot orthoses [23].

Specific tools for measuring the impact of foot pathology on foot pain function and disability in patients with rheumatic diseases have been used in research [24,25] and are now available for use in clinical practice.

The aim of this study was to identify the nature of foot problems experienced by patients attending the rheumatology outpatient's clinic at Rochdale Infirmary and to ascertain the availability of foot care services for these patients. At the start of the study it was known that at Rochdale Infirmary there was no dedicated specialist podiatry service for patients attending the Rheumatology Department. However, a small number of referrals were being sent to the podiatrists working alongside the orthopaedic consultants. The community podiatry service provided a foot care service to which patients could refer themselves.

## 2. Patients and methods

A convenience sample of 139 patients (100 female and 39 male) was recruited whilst attending the Rheumatology outpatient department at Rochdale Infirmary. The outpatients nurses asked each patient attending the clinic if they agreed

to their foot health being assessed even if they were already attending a podiatry service. Patients underwent an assessment as part of their consultation with the rheumatologist. Time was a limiting factor, therefore, only an average of eight patients were assessed in each clinic. No patient who was asked refused assessment.

The assessment included a foot health and footwear assessment carried out by an experienced podiatrist. In an attempt to increase objectivity and reduce bias, the podiatrist was not employed by the trust and was wholly independent from the service.

### 2.1. Foot health assessment

All patients had both feet examined. The presence of foot deformity, sites of callus formation, presence or history of ulceration, fungal infections of the skin and nails and other abnormalities were recorded on an assessment sheet. Foot pulses were assessed as being absent or weak or strong. colour changes and thinning of the skin were also noted. The patients were then categorised as having poor or good tissue viability. An objective assessment of footwear was carried out by the podiatrist, to ascertain the type and appropriateness of the patients footwear for the patients particular foot problems. This assessment was based on the specific variables of the shoe construction such as heel height, fastenings, sole thickness, heel counter thickness and overall shape of the shoe [26,27].

The patients were asked if they had any problems with the footwear, if they thought the footwear was suitable for their needs and if the footwear was comfortable. Similarly those patients who had been provided with foot orthoses were asked about the suitability of the devices and if they had been beneficial in reducing foot pain and providing stability. A biomechanical assessment was carried out on all patients.

Patients were also questioned about if they received professional foot care and what interventions were used (such as palliative care, foot orthoses or specialist footwear). Finally, the assessing podiatrist identified the patient's current and long term foot care needs.

### 2.2. Foot function index

The patients completed the foot function index (FFI) questionnaire following verbal instruction by the podiatrist. The foot function index [24], is a validated self-administered questionnaire that provides an index of foot pain, subsequent activity limitation and disability. The FFI consists of 23 items grouped in three domains: foot pain (9 items), disability (9 items) and functional limitation (5 items). All items are rated using a visual analogue scale and the higher scores indicate greater pain, disability and limitation of activity, and thus poorer foot health. To obtain a domain score, the item scores are totalled and divided by the total possible score of the number of items the patient indicated as applicable. This score for each domain is then multiplied by 100

and the total FFI score is the average of the three domain scores.

### 3. Results

The patients presented with a variety of rheumatic diseases, the majority presenting with rheumatoid arthritis and osteoarthritis (Table 1). With regards to co-morbid or associated conditions, which may present with manifestations in the lower limb, two patients presented with type 2 diabetes, three with Raynauds syndrome and three with vasculitis.

Overall, there was no difference between gender in the presenting foot problems and footwear suitability.

Over half (58%) the patients in the study presented with symptomatic callus under the foot ( $n = 81$ ) and/or on the toes (Fig. 2). There was a high prevalence of nail pathologies ranging from fungal infections of the nail (11%,  $n = 15$ ) to thick and deformed nails (68%,  $n = 86$ ) and ingrown toes nails (4%,  $n = 6$ ). Twenty-seven patients (19%) presented with plantar bursae and 6 (8%) with nodules. Only 17 (12%) had no cutaneous, nail or soft tissue problems.

Only 51% ( $n = 69$ ) of the total 139 patients were assessed by the podiatrist as having suitable retail footwear. Of the total number of patients presenting any type of foot

Table 1  
Primary rheumatic disease

Rheumatoid arthritis	74
Osteoarthritis	24
Systemic lupus erythematosus	10
Seronegative polyarthritis	6
Psoriatic arthritis	4
Ankylosing spondylitis	5
Fibromyalgia	3
Polymyalgia rheumatica	3
Gout	3
Reactive arthritis	2
Raynauds	2
Mixed connective tissue disorder (CTD)	1
Pagets disease	1
Undifferentiated CTD	1



Fig. 2. Pressure lesions on the toes of a patient with RA.

Table 2  
Patients foot care requirements

Immediate	20% ( $n = 28$ )
Routine foot care	72% ( $n = 100$ )
Footwear advice	61% ( $n = 85$ )
Foot orthoses	60% ( $n = 83$ )
Prescription footwear	10% ( $n = 14$ )
No foot care required	8% ( $n = 11$ )

problem ( $n = 122$ ) 62 had inadequate footwear contributing to or exacerbating their foot problems. Therefore, seven patients with unsuitable footwear avoided foot problems. Twenty (14%) of the 139 patients had been prescribed specialist footwear. However, a combination of the podiatrist's assessment and the patients opinion described 10 (50%) of these being inadequate due to poor fit, excessive wear and/or lack of comfort.

Over half of the patients were assessed as having poor tissue viability plus moderate to severe foot deformity (such as hallux abducto-valgus, clawing of the lesser toes, excessive pronation, and/or subluxation of joints) placing them at risk from foot ulceration.

Eleven (8%) patients had been supplied with foot orthoses. However, eight were deemed inadequate in reducing foot pain by the patient and four of these could not be used because they were either too hard or would not fit into the patients shoes. Following biomechanical assessment of all patients 83 (60%) were assessed as requiring foot orthoses as an intervention (Table 2).

Two patients had previously undergone foot surgery. One patient had a Fowler's procedure carried out by an orthopaedic surgeon and one patient had a second toe straightened by a podiatric surgeon. One further patient would have benefited from foot surgery for gross hallux abducto-valgus and hammer toes. A referral to the podiatric surgeon was carried out.

All patients completed the foot function index in full. The Foot Function Index demonstrated the effects of foot pain caused by joint and foot problems as demonstrated in the total FFI scores with a median score 45 (range = 32–80). All patients reported some level of foot pain. Ten patients reported extreme pain and this was reflected in their FFI scores. These patients were recently diagnosed with rheumatoid arthritis or were experiencing a flare of the disease.

With regards to professional foot care, over half (60%,  $n = 83$ ) the patients had never received foot care, 21% ( $n = 30$ ) received NHS foot care at their local clinic and 19% ( $n = 26$ ) had to purchase foot care privately. The use of private foot care was due to inaccessibility or infrequency of foot care at their local NHS clinic or as in two cases, personal choice. No patient in this study received foot care by a podiatrist specialising in the management of patients with rheumatic diseases.

The patient's foot care requirements as assessed by an experienced podiatrist are summarised in Table 2.

#### 4. Conclusions

Overall this study demonstrates that in this particular outpatient clinic, poor foot health and foot pain is highly prevalent in patients with rheumatic diseases. The impact of these problems results in various levels of functional limitation and disability in patients with both acute and chronic disease. The prevalence of plantar callosities (58%) and self reported foot pain (all reported some level of pain) is greater in this study compared with a study of older adults (31% presenting with plantar callus and 21% reported pain) [28].

Measurement of plantar foot pressures may have been a useful addition in the assessment of these patients. However, time constraints and lack of access to specialist equipment precluded this element of patient assessment.

When specialist professional foot care is provided, the potential benefits are improved foot health, reduction of foot pain and an improvement in general well-being. However, the provision of foot care for the patients in this study was inconsistent, untimely and sometimes inappropriate. An example of this was over debridement of plantar callus. A small clinical trial suggests that in patients with rheumatoid arthritis, reduction of plantar callus results in reduced foot pain but only for a period of 7 days; increased peak plantar pressures were demonstrated in 10 of the fourteen feet assessed [29]. This increase in plantar peak pressures and the loss of the protective nature of callus formation over prominent metatarsal heads puts the foot at risk of tissue necrosis and ulceration. In addition there was evidence of the use of adhesive padding in patients with low tissue viability. Adhesive padding causes maceration of the skin and a breakdown in the skins natural protection against opportunistic bacteria and fungal spores. Therefore, clinical guidelines [30] suggest that this practice is not recommended in patients with low tissue viability and compromised immune systems.

There was little evidence in this study of appropriate foot orthoses, although studies support their use in both early and late RA [16–18]. Likewise, there was little use of specialist footwear even though the benefits of this intervention have been documented [18]. In a review of 109 patients who attended a multidisciplinary rheumatology foot clinic [6] 53 patients reported foot pain, 83 were provided with foot orthoses and 47 provided with specialist footwear (33 stock shoes, 14 bespoke).

Patients with autoimmune disorders, and/or taking medication that compromises the immune system should be considered at risk of infection and foot ulceration, and therefore, should receive priority for specialist foot care. Likewise, patients with micro-vascular and/or large vessel disease, foot deformity and poor footwear are also at risk of foot trauma, ulceration and subsequent infection. Timely and appropriate specialist foot care and interventions are essential if we are to reduce the impact of foot problems in this patient group. The North West Clinical Effectiveness Guidelines for the Foot in Rheumatic Diseases [30] recommend that a specialist podiatrist should become a recognised member of the rheuma-

tology multidisciplinary team and become the clinical lead for foot problems associated with rheumatic diseases.

The results of this study supports the case for a dedicated and specialist foot care service to patients with rheumatic diseases in this locality whatever the patients age or stage of disease. However, the following recommendations could be applied to any rheumatology service. This paper recommends that in order to identify patients with foot problems, their consultant or specialist nurse should question patients about their feet. If foot problems are identified a referral to the specialist podiatrist should be made. Patients with disabling foot pain or who are at risk of foot ulceration should receive priority foot care. Foot orthoses should be considered for patients recently diagnosed with rheumatoid arthritis as this intervention has been demonstrated to reduce pain and the effects of abnormal joint function in the foot [19]. Specialist prescription footwear should be available for patients who cannot fit into appropriate retail footwear and in this area podiatrists and orthotists should collaborate to achieve the optimal clinical outcome [20].

This study demonstrates that there is an unmet need for specialist professional foot care in patients attending this particular rheumatology outpatient clinic. This may be the same for any rheumatology service where podiatrists are not part of the multidisciplinary rheumatology team and have not received specialist training in this area. However, larger multi-centre studies are required to investigate the scale of foot problems nationally. Rheumatology teams and podiatry services should collaborate and aim to improve the foot health service to patients with these disabling foot problems, if we are to meet the challenge of the Bone and Joint Decade [1].

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